

# Math 153 - Quiz 2

February 20, 2014

Name key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) Sarah scored 75 points on a test with mean 52 and standard deviation 7. Compute Sarah's z-score and use it to determine if her score is unusually high.

$$Z = \frac{75 - 52}{7} = \frac{23}{7} \approx 3.29$$

SINCE THIS IS GREATER THAN 2,  
HER SCORE IS UNUSUALLY  
HIGH.

2. (3 points) Sally scored 43.5 on a test with mean 40 and standard deviation 2. Fred scored 281 on a test with mean 250 and standard deviation 19. Compute the corresponding z-scores. Who received the better score?

$$Z_{\text{SALLY}} = \frac{43.5 - 40}{2} = 1.75$$

SALLY'S SCORE IS HIGHER  
(RELATIVELY) THAN FRED'S.

$$Z_{\text{FRED}} = \frac{281 - 250}{19} \approx 1.63$$

3. (5 points) The following are yearly numbers of Illinois tornadoes from 1980 to 2009 listed in increasing order.

14	14	15	15	19	20	20	21	22	22
23	23	29	32	33	34	34	35	35	47
50	55	59	62	64	76	80	99	120	124

- (a) Compute the quartiles.

$$Q_2 = \text{MEDIAN} = \frac{33 + 34}{2} = 33.5$$

$$Q_3 = 23^{\text{RD}} \text{ VALUE} = 59$$

$$Q_1 = 8^{\text{TH}} \text{ VALUE} = 21$$

- (b) Find the percentile corresponding to the number 55.

$$\frac{21}{30} \times 100 = 70 \quad 70^{\text{TH}} \text{ PERCENTILE}$$

- (c) What number of tornadoes would be at the 70th percentile?

DUH, 55. SEE PART (b). HOWEVER, IF WE COMPUTE IT  
USING THE BOOK'S PROCEDURE, WE GET...

$$L = 0.70(30) = 21 \quad (\text{A WHOLE NUMBER!})$$

$$\frac{21^{\text{ST}} + 22^{\text{ND}}}{2} = \frac{50 + 55}{2} = 52.5$$